



Saskatchewan
Ministry of
Agriculture



BEE LINES

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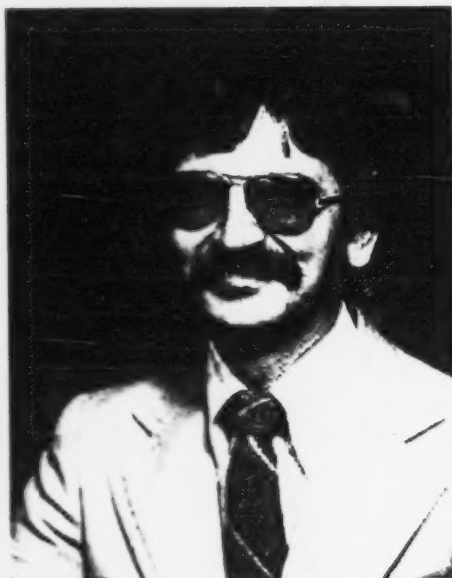
Winter 2009

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Issue # 116

PRODUCTION

Farewell to John Gruszka



Then...



and Now.

After 32 years of service to the Government of Saskatchewan and Saskatchewan beekeepers, John Gruszka will retire next spring. During his time as the Provincial Apiculturist there were many trials and successes in the beekeeping industry. John has helped to navigate the Saskatchewan beekeeping industry through many challenges. His work has helped improve over-wintering of bees in Saskatchewan, and delayed the invasion of tracheal mites, Varroa mites and drug- and acaricide-resistant pests in the province. All of this helped to mitigate the negative effects of these pests and diseases on the province's beekeepers.

John also played an important part in planning Apimondia '99 in Vancouver and helped to make it such a great success. He was an active contributor to the Canadian Association of Professional Apiculturists (CAPA), including a period as president from 1980 to 1985, where he represented Saskatchewan on the national stage. John's career included receiving such prestigious awards as the Fred Rathje Memorial Award in 2000 from the Canadian Honey Council, the Distinguished Agrologist Award in 2005 from the Saskatchewan Institute of Agrologists and the Canadian Association of Professional Apiculturalists' Outstanding Service Award in 2008.

Thanks, John!



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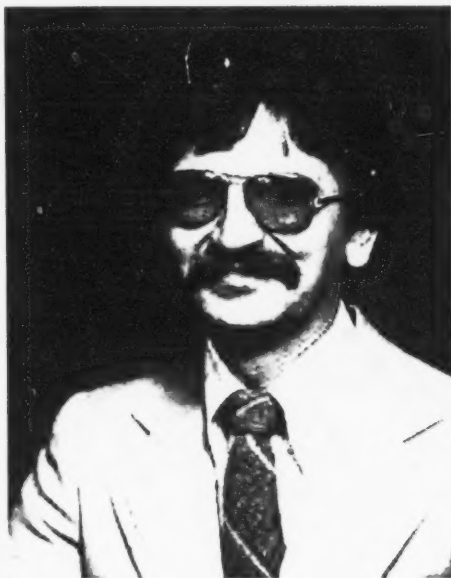
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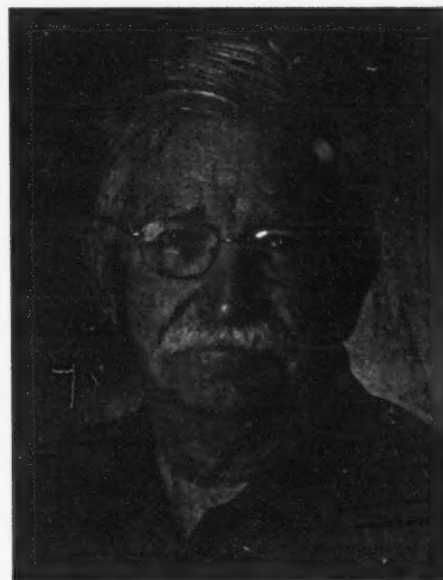
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Thanks, John!

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Disease Control Recommendations for Mites (2010)

NOTE: The following is an overview of the control options for pests and diseases. Read all labels before applying the treatment. The directions on the label are the law. Application methods can change so label directions take precedence over recommendations provided in this document. At present, there are no control products that can be used during a honey flow.

Management Planning

A management plan for mite control that uses multiple treatment tools is important. Using products with different active ingredients reduces reliance on a single product, and will help reduce the development of resistance to a specific active ingredient. After a product is used, test mite levels to determine if the treatment was effective (remember to "test – treat – test").

Following are examples of mite control plans that should be effective for both tracheal and Varroa mites:

1. Organic acid treatment regimen
 - a. Formic acid in the spring
 - b. Oxalic acid in late fall/early winter.
2. Synthetic and organic acids treatment regimen
 - a. Formic acid in the spring
 - b. Checkmite+™ OR Apistan® OR Apivar® in the fall (never use these products at the same time and check for resistance before using these products).

Varroa Mite (*Varroa destructor*) Control

Monitoring:

Monitoring, or testing, is becoming essential in mite management. It is important to know the levels of mites in the bee colonies to be able to make appropriate treatment decisions. Do not treat individual colonies; treat the entire bee yard, if not the entire operation.

There are many methods for monitoring Varroa mite levels, and all have advantages and drawbacks. The two most effective and simple sampling techniques are described here.

1. Alcohol wash

In a jar containing approximately 150 ml of ethyl alcohol, collect a sample of 300 bees from near the brood area of the colony. Shake the bees vigorously for two to five minutes. Place a white cloth over a bucket and a screen over the white cloth. Pour the bees and alcohol onto the screen, allowing the alcohol to drain into the bucket. Rinse the jar with another 150 ml of alcohol and pour over the sampled bees. Rinse the bees with another 150 ml of alcohol. Look for mites on the white cloth. Adult mites will be a flattened, oval shape, 1 to 1.8 mm long and 1.5 to 2 mm wide, and reddish-brown in colour. Return the bees to a jar of alcohol and repeat the process until no additional mites are found. The alcohol can be reused for more samples.

Alternatively, samples of approximately 300 bees in a jar of alcohol can be shipped to the honey bee diagnostic lab to be examined for tracheal and Varroa mites.

Send samples to:

Geoff Wilson
Saskatchewan Ministry of Agriculture
800 Central Ave, Box 3003
Prince Albert SK S6V6G1

2. Sticky bottom boards

Use a commercially prepared insect trap glue or a 50:50 mixture of shortening and petroleum jelly to coat a 30x40-cm sheet of thick paper. Place the paper sticky side up on the bottom board of the bee colony and cover with a screen. Leave the sticky board in place for one to three days. Remove the sticky paper and count the mites; divide the number of mites by the number of days the sticky trap was in the colony.

Treatment Thresholds:

Current research suggests that the treatment thresholds for Varroa mites are:

Spring:

One per cent mite infestation based on a 300-bee alcohol wash (i.e. three mites per 300 bees)

or

Two mites found on a natural drop sticky bottom board within a 24-hour period.

Fall:

Two per cent mite infestation based on a 300-bee alcohol wash (i.e. six mites per 300 bees)

or

12 mites found on a natural drop sticky bottom board within a 24-hour period.

Treatment Products

Apistan® (active ingredient: 10.25% fluvalinate)

Treatment window: Spring and fall

Strips cannot be applied with honey supers on the colonies. Honey supers can be applied after the treatment is removed.

Remove strips from the package just before application. Do not remove unused strips from the original package. Use one strip for every five frames (or less) of bees. The strips should be distributed evenly throughout the brood chamber and need to be in contact with the bees in the brood nest. Remove the strips at the completion of the treatment on day 42.

Caution: Wear chemical-resistant gloves while handling the strips.

Checkmite+™ (active ingredient: 10% coumaphos)

Treatment window: Spring and fall

Strips cannot be applied with honey supers on the colonies. Honey supers can be applied 14 days after the treatment is removed.

Remove strips from the package just before application. Do not remove remaining strips from the original package. Use one strip for every five frames (or less) of bees. The strips should be distributed evenly throughout the brood chamber and need to be in contact with the bees in the brood nest. Remove the strips at the completion of the treatment on day 42.

Caution: Wear chemical-resistant gloves while handling the strips. It is not recommended to treat with Checkmite+™ more than once per year.

Apivar® (active ingredient: 3.33% amitraz)

Note: Apivar® has been granted an emergency use registration by the Pest Management Regulatory Agency (PMRA) for the period July 1, 2009, to June 30, 2010. The emergency registration expires on July 1, 2010. Beekeepers should be watching for updates on registration for 2010.

Treatment window: Spring and fall

Strips cannot be applied with honey supers on the colonies. Honey supers can be applied 14 days after the treatment is removed.

Remove strips from the package just before application. Do not remove remaining strips from the original package. Use one strip for every five frames (or less) of bees. The strips should be distributed evenly throughout the brood chamber and need to be in contact with the bees in the brood nest. Remove the strips at the completion of the treatment on day 42.

Caution: Wear chemical-resistant gloves while handling the strips.

Mite-Away II™ (active ingredient: 47.65% formic acid)

Mite-Away II™ is a single-application pad that is effective on both Varroa and tracheal mites.

Treatment window: Spring (mid-May to mid-June) and fall (as soon as the honey supers are removed). *Formic acid treatments must be finished two weeks before honey flow.*

Place half-inch spacers on the top bars close to the brood area. Place a Mite Away II™ pad on the spacers. Use a 1½-inch rim between the brood boxes and the cover to allow sufficient space for the pad.

Caution: Wear appropriate safety gear including goggles, chemical-resistant gloves, protective clothing and boots. Avoid inhaling vapours.

Repeated Application Pads (active ingredient: 65% formic acid)

Note: This application is currently under review by the PMRA. This is an interim registration as explained in the note to CAPCO "Proposed Scheduling of 65 Percent Formic Acid for the Detection and Control of Honey Bee Mites" (C94-05) and will only be available until December 10, 2010, unless a submission for full registration is received. For more information, go to: http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/c94-05/index-eng.php.

Treatment window: Spring (mid-May to mid-June) and fall (as soon as the honey supers are removed). *Formic acid treatments must be finished two weeks before honey flow.*

Apply 35 mL of a 65-per-cent formic acid solution in an absorbent pad on the top bars of the colony. Repeat the treatment six times four days apart. Some variations (in accordance with CAPCO) may be made to the treatment to improve the efficacy.

Caution: Wear appropriate safety gear including goggles, chemical-resistant gloves, respirators fitted with an organic acid filter, protective clothing and boots.

Oxalic Acid (active ingredient: >99.6% oxalic acid dihydrate)

Treatment window: Late fall and early spring when there is little to no brood in the colony.

Vapourizer Method: Seal all cracks and the upper entrance, and restrict the lower entrance of the hive. Smoke bees on the bottom entrance. Place two grams of oxalic acid dihydrate onto the vapourizer and follow the vapourizer's directions to sublime the oxalic acid in the bottom entrance.

Caution: Wear appropriate safety gear including goggles, chemical-resistant gloves, respirators fitted with an organic acid filter, protective clothing and boots. Do not treat indoors.

For more information on the Conditions of Use for Oxalic go to: <http://www.honeycouncil.ca/documents/LabelOxalicE.pdf>.

Non-Chemical Management Techniques for Varroa Mites

1. Stock Selection

Re-queen colonies with stock selected for Varroa resistance/tolerance.

2. Mite trapping with drone brood (may not be practical on a large scale)

Remove old combs that contain drone brood. Place plastic frame with drone foundation into the brood chamber and allow the bees to make drones. Remove the comb before the drones have emerged. Scrape the drone brood off the foundation and replace the frame in the colony. Remove the scrapings from the beeyard and render the wax. Alternatively, freeze the frame for a week to kill the Varroa mites, and replace in the hive for the bees to clean up. This treatment needs to be repeated six to eight times during a season to achieve 80 to 90 per cent efficacy. Do not allow the drones to hatch: hatching drones will greatly increase the Varroa mite levels in the colony.

3. Screen Bottom Boards

Use an 8x8-inch piece of screened hardware cloth to create a bottom board with at least a 1½-inch space below the screen. Screened bottom boards have shown efficacy of zero to 30 per cent.

Note: These boards may slow down colony development in cold climates.

Tracheal Mite (*Acarapis woodi*) **Control**

Monitoring:

Samples of approximately 300 bees in alcohol can be shipped to the honey bee diagnostic lab to be examined for tracheal and Varroa mites.

Samples should be sent to:

Geoff Wilson
Saskatchewan Ministry of Agriculture
800 Central Ave, Box 3003
Prince Albert SK S6V6G1

Treatment Products

Mite-Away II™ (active ingredient: 47.65% formic acid)

Mite-Away II™ is a single-application pad that is effective on both Varroa and tracheal mites.

Treatment window: Spring (mid-May to mid-June) and fall (as soon as the honey supers are removed). *Formic acid treatments must be finished two weeks before honey flow.*

Place half-inch spacers on the top bars close to the brood area. Remove the pad from the outer plastic cover, being sure to leave the inner blue plastic cover with holes surrounding the inner pad. Place a pad on the spacers. Use a 1½-inch rim between the brood boxes and the cover to allow sufficient space for the pad.

Caution: Wear appropriate safety gear including goggles, chemical-resistant gloves, protective clothing and boots.

Repeated Application Pads (active ingredient: 65% formic acid)

Note: This application is currently under review by the PMRA. This is an interim registration as explained in the note to CAPCO "Proposed Scheduling of 65 Percent Formic Acid for the Detection and Control of Honey Bee Mites" (C94-05) and will only be available until December 10, 2010, unless a submission for full registration is received. For more information, go to: http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/c94-05/index-eng.php.

Treatment window: Spring (mid-May to mid-June) and fall (as soon as the honey supers are removed). *Formic acid treatments must be finished two weeks before honey flow.*

Apply 35 mL of a 65-per-cent formic acid solution in an absorbent pad on the top bars of the colony. Repeat the treatment six times four days apart. Some variations (in accordance with CAPCO) may be made to the treatment to improve the efficacy.

Caution: Wear appropriate safety gear including goggles, chemical-resistant gloves, respirators fitted with an organic acid filter, protective clothing and boots.

Menthol (active ingredient: menthol crystals)

Note: For more information, see the CAPCO Note "Scheduling of menthol for honey bee tracheal mite control": http://www.hc-sc.gc.ca/cps-spc/pubs/pest/_decisions/c92-05/index-eng.php.

Treatment window: Spring (mid-May to mid-June) and fall (as soon as the honey supers are removed). *Menthol treatments must be finished two weeks before honey flow.*

Warm shortening just to the melting point (65°C). Mix the warmed shortening with an equal amount of menthol by weight. Dip 30x30-cm sheets of corrugated cardboard into the mixture until saturated; remove and cool. Store the sheets in a sealed container in the freezer until they are to be used. Place one sheet of cardboard on the bottom board of the hive and replace it after seven days. Remove the treatment after 14 days.

Caution: Wear appropriate safety gear including goggles and chemical-resistant gloves. Use in a well-ventilated area.

Non-Chemical Management Techniques for Tracheal Mites

1. Stock Selection

Re-queen colonies with stock selected for tracheal mite resistance.

The Importance of Monitoring Bees for Mites: Techniques and Timing

There have been many calls to the apiculture office this year asking about testing/sampling results and what they mean. As a result of these calls, evidence of resistance to Apistan® and Checkmite™ was identified, and high mite levels were spotted while there was still time to save the hive. All of these cases show the importance of testing, and, because the problems were noticed before the mites hit economic thresholds, action was able to be taken to correct the problem before it got bigger.

Testing is also useful to ensure that previous treatments worked and to determine whether a different treatment is needed. (Remember to test – treat – test.) As with other important beekeeping tasks, the timing and the technique of sampling can significantly affect the reliability of the results.

Testing should be done regularly, including after the treatment. Testing after treatment will determine whether or not the control measure worked. This is becoming more important, especially with the development of resistant mites and the use of "soft" treatments like oxalic and formic acids, which have inherently variable efficacy on Varroa mites.

To be used on a large scale, testing must be simple, efficient, and accurate. The two best methods are an alcohol wash and sticky bottom boards without an acaracidal strip. Other methods like ether rolls, sugar shakes and drone brood sampling are not as accurate and are often more difficult or slower than alcohol washes and sticky bottom boards.

Although in the past the use of an acaracidal strip like Apistan® was recommended to determine presence and levels of mites, this technique is becoming of questionable use. Resistance to miticides is developing and spreading throughout the province. If this technique is used with an ineffective acaricide, the mite fall will be artificially low and the threshold for treatment levels will not be apparent. An additional problem is that resistance will be masked because the same ineffective treatment is being used for both treatment and testing.

It is in all beekeepers' best interest to keep testing for Varroa mites. Maintain the testing vigilance to know what is happening in your colonies and you will be able to make more informed decisions regarding mite control. Keeping your bees alive will improve your bottom line.

Feed Concerns Using High-Fructose Corn Syrup and HMF

It was recently reported in the *Journal of Agricultural and Food Chemistry* that when high-fructose corn syrup is heated, hydroxymethylfurfural (HMF) is formed, which is dangerous to honey bee colonies. Dr. Blaise LeBlanc and Dr. Diana Summataro measured the levels of HMF in high-fructose corn syrup products from different manufacturers over a period of 35 days and heated to different temperatures. As temperatures rose, levels of HMF increased steadily and levels jumped dramatically at about 120°F.

This may be of concern to beekeepers using corn syrup in their fall feed. Feed that is not consumed over the winter and is kept until spring should present no problems under our climatic conditions as long as the syrup is stored outdoors or

in unheated buildings. However, a problem may arise if the remaining corn syrup is not used in the spring and sits in the tanks over the summer to be fed in the fall.

Rob Currie of the University of Manitoba has determined that high-fructose corn syrup stored over the summer under normal conditions may not be suitable for bee feed in the fall due to the summer heat altering its chemical composition. LaBlanc and Summataro's recent research supports Currie's findings and identifies the main culprit as higher levels of HMF.

This report would indicate that storing syrup over the summer might not be a good idea. Beekeepers should be prepared to use all of their fall-feed corn syrup in the fall or, at the very least, in the spring.

The article goes on to say that this may have some serious consequences for manufacturers of human food containing high-fructose corn syrup. A food product with high-fructose corn syrup being reheated in a microwave can easily hit 120°F. High levels of HMF are harmful to humans as well as to honey bees.

Colony Collapse Disorder Research in the United States

A report by the Colony Collapse Disorder (CCD) Steering Committee published in June 2009 has indicated that the loss of honey bees to CCD in the U.S. cannot be attributed to a single cause. A recent study led by Dr. May Berenbaum of the University of Illinois indicates that one of the causes of CCD may be multiple viruses that wear down the bees' ability to produce proteins that protect them against infection.

The report states: "Berenbaum and colleagues at the USDA screened thousands of guts of honey bees from both healthy and CCD-stricken colonies. CCD bees had several unusual RNA fragments resulting from broken malfunctioning ribosomes. Multiple infections with a family of viruses called the picorna-like viruses, which seem to especially afflict CCD bees, could cause the appearance of such RNA fragments as they overwhelmed ribosomes and limited the bees' ability to manufacture functioning proteins. Bees that are not able to make proteins cannot mount effective responses to viral or bacterial infection or respond to dietary shortages."

As research continues, it is becoming apparent that a single source or cause of the problem is unlikely to be found. Other work regarding viruses, such as the acute paralysis virus and the Israeli acute paralysis virus, as well as the impact of *Nosema ceranae*, indicate that there may be many factors involved in the loss of colonies. Underlying all of this research is the fact that Varroa mites seem to be a vector for many of these viruses, and it is very likely that the inability

to control Varroa mites may be a basic underlying cause of CCD.

This research underlines the importance of testing, treating and testing again to insure that Varroa mite levels are maintained below economic threshold levels. Otherwise, increased Varroa mite levels could lead to increased winter colony loss in Saskatchewan.

Honey Producers to be Compensated for Bear Damage

Saskatchewan Ministry of Agriculture News Release, September 1, 2009

The Wildlife Damage Compensation Program, which is administered by the Saskatchewan Crop Insurance Corporation, will now provide compensation to bee producers for damage caused by bears to bee hives and huts, loss of honey production, and loss of honey bees and leaf cutter bee larvae.

"Bears cause significant damage to bee hives every year in Saskatchewan," Agriculture Minister Bob Bjornrud said. "By compensating honey producers for these losses, we are continuing our commitment to improving the Crop Insurance program."

The annual cost of this program improvement is estimated at \$200,000.

"Improving this program to help cover the costs associated with bears and bear damage is good news for Saskatchewan beekeepers," Saskatchewan Beekeepers Association President Calvin Parsons said. "Bear damage has always been more than the lost equipment. Bear damage for beekeepers includes the lost honey and the costs associated with replacing the honeybees themselves."

The Wildlife Damage Compensation Program also provides compensation on all seeded commercial crops, stacked hay, silage, bales, market gardens, tree nurseries and sod farms for damage caused by white-tailed deer, mule deer, antelope, elk, moose, bison, bears, ducks, geese and sandhill cranes that have not been held in captivity.

Beginning in 2009, producers receive 100 per cent compensation for wildlife damage for any claim of \$150 and over. The first 80 per cent is cost-shared by federal and provincial governments; the provincial government contributes the remaining amount. There are no producer premiums and producers do not require a crop insurance contract in order to receive compensation.

For more information or to register a claim, producers can contact their local Crop Insurance office or call 1-888-935-0000 or visit www.saskcropinsurance.com.

Registration Update

Beelines is sent to all registered beekeepers in the province.

If you are no longer keeping bees and wish to be removed from the mailing list, contact Saskatchewan Agriculture's Apiculture Office in Prince Albert at (306) 953-2304 (a message containing your name and address can be left at any time) or email the Provincial Apiculturalist at:

geoff.wilson@gov.sk.ca.

Email Addresses

If you wish to share your email address with the Apiculture Office, send an email to

geoff.wilson@gov.sk.ca

and your name will be placed on the beekeeper contact list. The email list will be used to send out information of importance to beekeepers on a short notice (e.g. winter loss survey, pesticide registrations or updates, etc.)

We welcome all who may be interested. It does not matter whether you are a hobby beekeeper or a large commercial beekeeper, having your email address on file will be a benefit to all.

Saskatchewan Agriculture

www.agriculture.gov.sk.ca